SHARP SERVICE MANUAL

ELECTRONIC CASH REGISTER

No.2: Hardware manual

ER-1911 (Europe Ver.)
ER-1921
ER-2386 (U.S.A. Ver.)
MODEL **ER-2396**

SRV Key : LKGIM7113RCZZ

CONTENTS

SHARP CORPORATION

This document has been provided for service training program and is subject to revision without notice.

I. ER-1911/ER-2386

1. TEST FUNCTION (ER-1911/ER-2386)

1-1. Start of test function

The following key operation is required in the SRV1 mode to start the test

$$XXXX \rightarrow \boxed{RF} \text{ or } \boxed{RFND}$$
Test command

RF key : ER-1911
RFND key : ER-2386

1-2. List of test command

No.	Description	Key operation
1	Mode switch test	1 → RF or RFND
2	Key test	XXX02 → RF or RFND
3	Display test	3 → RF or RFND
4	Buzzer test	4 → RF or RFND
5	Receipt ON/OFF switch test	5 → RF or RFND
6	Drawer open test (with option installed)	6 → RF or RFND
7	Printer test	7 → RF or RFND
8	RAM test	8 → RF or RFND
9	Key position code test	9 → RF or RFND
10	Sequential test	XXX11 → RF or RFND

XXX : Sum check data for standard key layout
ER-1911(5DEPT.)=22   ER-2386=237
ER-1911(10DEPT.)=213

1-3. Test description
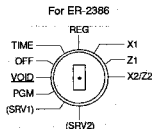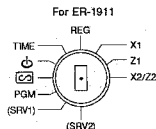
1) Test No.1 : Mode switch test

① Key operation

1 → RF or RFND

Then, turn the mode switches in the following order.

Mode switch operation	Display
SRV1	1
PGM	2
⊘ or VOID	3
⏻ or OFF	
TIME	4
REG	5
X	6
Z	7
X2/Z2	8

Mode switch position layout

For ER-1911   For ER-2386

② Description
As the mode switch position number is displayed, check the number.

③ Termination
The mode can be terminated when the mode switch is turned to the SRV1 side from other position.

Termination print :   1
Error print :   1 E

2) Test No.2 : Key test

① Key operation

$$XXXX \ 02 \rightarrow \boxed{RF} \text{ or } \boxed{RFND}$$
Test command
Sum check data

Enter the test command in succession to the sum check data of the model.

Mode1	Sam check data
ER-1911 : 5DEPT.	22*
ER-1911 :10DEPT.	213*
ER-2386 :10DEPT.	237*

* NOTE : Sum check data
The checksum is a decimal number obtained by converting low two digits of the hard code haxadecimal total of all keys. The TL or CA/AT keys are exception.

· Next, push every key on the keyboard except for the receipt and journal keys.
When the TL or CA/AT key is depressed, the termination printout is immediately produced assuming that all keys have been depressed.
There is no order in which the keys have to be depressed.
· Keyboard position code of model vs. key lay out

[All key position code]

[ER-1911]
5 DEPT.

10 DEPT.

A2	12	02

R ↑	J ↑		41	42	72		32	14		01
43	44		92	82	73		B2	13		22
54	53		93	83	74		B4	34		24
52	63		81	94	84		B3	33		23
51	62			61	64		B1	31		TL

[ER-2386]

A2	12	04	02	03

R ↑	J ↑		41	42	72		32	14			01
43	44		92	82	73		B2	13			22
54	53		93	83	74		B4	34		11	24
52	63		81	94	84		B3	33			23
51	62			61	64		B1	31			CA/AT

② Description

Until the depression of the [TL] or [CA/AT] key, the sum of key position codes is compared with the sum check data, except for the [TL] or [CA/AT] key.

③ Display

2	5 - 1

- Display the hard code of the key pressed.
- High and low digits of the hard code are separated with a hyphen "-".
- If the hard code value is A or B, it will be converted into decimal equivalent and displayed.

  A → 10
  B → 11

④ Termination

The test terminates with the depression of the [TL] or [CA/AT] key and the termination printout is produced.

Termination print : | 2 |
Error print : | – – – – – – 2 E |

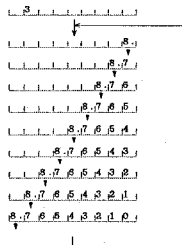### 3) Display test

① Key operation

3 → [RF] or [RFND]

③ Description

The display pattern is kept displayed in the given interval after the test mode was established.

Press any key to cancel the test mode. In this event, the display returns to the initial message display.

- Display

③ Termination print : | 3 |

4) Test No.4 : Buzzer test

① Key operation

4 → [RF] or [RFND]

② A continuous beep will be issued when in this mode. Press any key to cancel the test mode. The beeper will then be turned off.

- Display

4

③ Termination print : | 4 |

5) Test No.5 : Receipt ON/OFF test

① Key operation

5 → [RF] or [RFND]

② Description

The following is displayed according to the location of the receipt on/off switch.

Display : | 5   0 | Receipt on (contacts open)
Display : | 5   C | Receipt off (contacts closed)

③ Termination

With depression of any key.

Print out : | 5 |

6) Test No.6 : Drawer open test

① Key operation

6 → [RF] or [RFND]

② Description

With this test, the drawer opens and its state is displayed in the following manner.

Display : | 6   0 | Drawer open
Display : | 6   C | Drawer close

For the model with the drawer open sensor, check that the display shows "0" when the drawer opens, and "C" when it closes.

For the model without the drawer open sensor, check that the display always shows "C".

③ Termination
With depression of any key.
Print out : | 6 |

7) Test No.7 : Printer test

① Key operation

7 → RF or RFND

② Description
Receipt switch in the position OFF: Continuous printing is done.
Receipt switch in the position ON : After a cycle of printing, the operation terminates automatically.
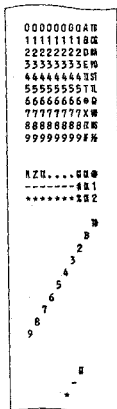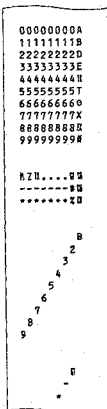
Display : 7

③ Termination
When the receipt switch is tuned from OFF to ON position while printing is continuing, the test terminates after a cycle of printing.

[A continuous print example]

ER-2386   ER-1911

```
00000000ATB              00000000A
111111118Q               111111118B
22222222DM               22222222D
33333333EM               33333333E
4444444433T              4444444433
555555555TL              555555555T
666666660O               666666660
77777777X8               77777777X
88888888NB               88888888N
99999999Fh               999999998

AZU....8U8               AZU....8U
-------8L1                -------8U
++++++X82                ++++++X8
                8
        B                        B
       2                        2
      3                        3
     4                        4
    5                        5
   6                        6
  7                        7
 8                        8
9                        9

        U                        U
        -                        -
        *                        *
```

8) Test No.8 : RAM test

① Key operation

8 → RF or RFND

② Description
After writing the following data in the RAM, the data is check by reading the RAM.
If an error occurs, the operation ends with the termination error printout.
The application will handle it as address 0000H~3FFFH and 4-bit data by the handler and converted to the address 0000H~1FFFH and 8-bit data.
NOTE: The data in the RAM is cleared by this test.
Perform a master reset function after this test is completed.

Address vs. data

		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0 0 1 X		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0 0 2 X	F	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	
0 0 4 X	E	F	0	1	2	3	4	5	6	7	8	9	A	B	C	D	
0 0 8 X	D	E	F	0	1	2	3	4	5	6	7	8	9	A	B	C	
0 1 0 X	C	D	E	F	0	1	2	3	4	5	6	7	8	9	A	B	
0 2 0 X	B	C	D	E	F	0	1	2	3	4	5	6	7	8	9	A	
0 4 0 X	A	B	C	D	E	F	0	1	2	3	4	5	6	7	8	9	
0 8 0 X	9	A	B	C	D	E	F	0	1	2	3	4	5	6	7	8	
1 0 0 X	8	9	A	B	C	D	E	F	0	1	2	3	4	5	6	7	
2 0 0 X	7	8	9	A	B	C	D	E	F	0	1	2	3	4	5	6	

The write data to other address will be 0.

Display : 8

③ Termination
| 8 | | – – – – – – – 8 E |
Normal termination print out   Error print out

9) Test No.9 : Key position code test

① Key operation

9 → RF or RFND

② Description
Shows the hard code of the key pressed, except for the TL or CA/AT key.
Press the TL or CA/AT key to cancel this test mode.
· Display
| 9 | | 5 – 1 | Indicates the hard code of the key depressed.

High and low digits of the hard code are separated with a hyphen "-".
If the hard code value is A or B, it will be converted in to decimal equivalent and displayed.
③ Termination
Print out : 9

10) Test No.10 : Sequential test

① Key operation

XXX 10 → RF or RFND
           Sum check data

② Description
Checksum for the keyboard test is similar as the Job#02, is a decimal number obtained by converting low two digits of the hard code hexadecimal total of all keys.
With this test, test items 1~8 are executed in succession. The basic print pattern, however, is used for the printer aging test of Item 7.
The basic print pattern will be printed just for once, regardless of the receipt switch position.
Termination print (or error print) will be obtained every time a test has completed before going to a next test.
After completion of the test item 8, the stamp is printed and a receipt is issued and the sequential test terminates.

Key operation, display, and printout of tests

No.	Test	Key operation	Display	Print (normal pattern)	Note
1	Mode switch	Mode switch ↕ SRV1	`1        1` `1        2` ⟨ `1        8`	`1`	
2	Key	Key entry TL key	`2    4 = 3`	`2`	
3	Display	`3` ↓ `8` ▼ `8 7` ▼ `8 7 6` ▼ ⟨ `8 7 6 5 4 3 2 1` `8 7 6 5 4 3 2 1 0` ▼ (Any key)	`3`	The display pattern will continue until a key is pressed.
4	Beeper	(Any key)	`4`	`4`	Beep / Beep stop
5	Receipt ON/OFF	(Any key)	`5        O` `5        C`	`5`	Receipt issue active / Receipt issue not active
6	Drawer open	(Drawer close) (Any key)	`6        O` `6        C`	`6`	Drawer open NOTE: Drawer open sensor kit must be installed.
7	Print		`7`	`0 1 2 3 4 5 6 7 EX⅛` `9 8 7 6 5 4 3 2 B -` `0 1 2 3 4 5 6 7 EX½` `9 8 7 6 5 4 3 2 B Tb`	ER-1911 ER-2386
8	RAM		`8`	`8`	
–				(Stamp printed and receipt issued)	

③ Termination
All tests automatically terminate open finishing the stamp test.

2. CIRCUIT DESCRIPTION (ER-1911/2386)

Circuit block diagram
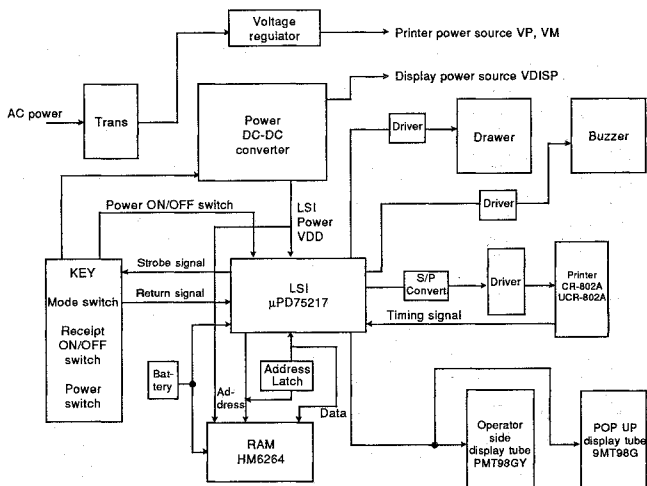
Fig. 2-1

2-1. μPD75217 Terminal signal

No.	Name	Description	I/O
1	S3	Key strobe/Display tube segment signal (d)	out
2	S2	Key strobe/Display tube segment signal (c)	out
3	S1	Key strobe/Display tube segment signal (b)	out
4	S0	Key strobe/Display tube segment signal (a)	out
5	P00	Power off signal	in
6	P01	Print data shift clock output	out
7	P02	Print data output	out
8	P03	Key return signal	in
9	α	Printer timing signal input	in
10	P11	Key return signal	in
11	P12	Key return signal	in
12	P13	Key return signal	in
13	-CS1	RAM chip select signal	out
14	-WE	RAM write signal	out
15	P22	Printer motor on signal	out
16	P23	Drawer open signal	out
17	P30	Mode switch return	in
18	P31	Key return signal	in
19	P32	Address latch enable for RAM	out
20	A12	RAM Address bus A12	out
21	A8	RAM Address bus A8	out
22	A9	RAM Address bus A9	out
23	A11	RAM Address bus A11	out
24	A10	RAM Address bus A10	out
25	D7/A0	Data bus D2/Address bus A10	in/out
26	D6/A1	Data bus D1/Address bus A1	in/out
27	D5/A4	Data bus D0/Address bus A4	in/out
28	D4/A2	Data bus D7/Address bus A2	in/out
29	PP0	Buzzer signal	out
30	X1	X'tal terminal 4.19MHz	in
31	X2	X'tal terminal 4.19MHz	in
32	VSS	GND	in
33	XT1	Timer X'tal terminal 32.768KHz	in
34	XT2	Timer X'tal terminal 32.768KHz	in
35	D0/A7	Data bus D0/Address bus A7	in/out
36	D1/A6	Data bus D1/Address bus A6	in/out
37	D2/A5	Data bus D2/Address bus A5	in/out
38	D3/A3	Data bus D3/Address bus A3	in/out
39	-RESET	Reset signal input	in
40	T0	Display tube 1st digit drive signal	out
41	T1	Display tube 2nd digit drive signal	out
42	T2	Display tube 3rd digit drive signal	out
43	T3	Display tube 4th digit drive signal	out
44	T4	Display tube 5th digit drive signal	out
45	T5	Display tube 6th digit drive signal	out
46	T6	Display tube 7th digit drive signal	out
47	T7	Display tube 8th digit drive signal	out
48	T8	Display tube 9th digit drive signal	out
49	T9	NU	
50	PH3	NU	
51	PH2	NU	
52	PH1	Printer magnet data output enable signal	out
53	PH0	Printer magnet data strobe signal	out
54	S11	Key strobe signal	out
55	S10	Key strobe signal	out
56	Vload	Power (-20V) for display	in
57	Vpre	Power (-4V) for display	in
58	S9	Key strobe signal	out
59	S8	Key strobe signal, Display tube segment (▼)	out
60	S7	Key strobe/Display tube segment (DP) signal	out
61	S6	Key strobe/Display tube segment signal (g)	out
62	S5	Key strobe/Display tube segment signal (f)	out
63	S4	Key strobe/Display tube segment signal (e)	out
64	VDD	Power (+5V)	in

2-2. Circuit description
1) RAM Read/write circuit

Fig. 2-2

Since the 8-bit data bus of the µPD75217 shares the same lines with the 8-bit address bus of the HM6264, selection of the RAM chip by the µPD75217 causes the HC373 to latch the 8-bit address when P32 of µPD75217 is inputted.

RAM data read timing

2) Battery Circuit

— : Battery recharge current
--→ : Battery discharge circuit

Fig. 2-3

3) P-OFF Circuit

Fig. 2-4

At power on
When P-ON voltage reaches 16V, the current flows through the zener diode (MTZ16B) so that the level at point Ⓐ goes high. The level of P-OFF rises as VCC increases. As a result, the P-OFF signal changes from low to high level.

At power off
When the power is turned off, the P-ON voltage drops under 15V causing the zener diode to stop current flow, which causes potential at point Ⓐ to drop.

Fig. 2-5

4) Key and switch

Fig. 2-6

S0~S11	:	Key scan signal
P03, P11~P13	:	Key return signal
VO	:	Power switch
P-ON	:	Mode switch
P30K	:	Mode switch
		Return signal

5) Display control

Fig. 10-7

a~g :   Display segment
DP :   Decimal point
▼ :   Indicator
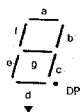
Fig. 2-7

6) Printer control

Block diagram
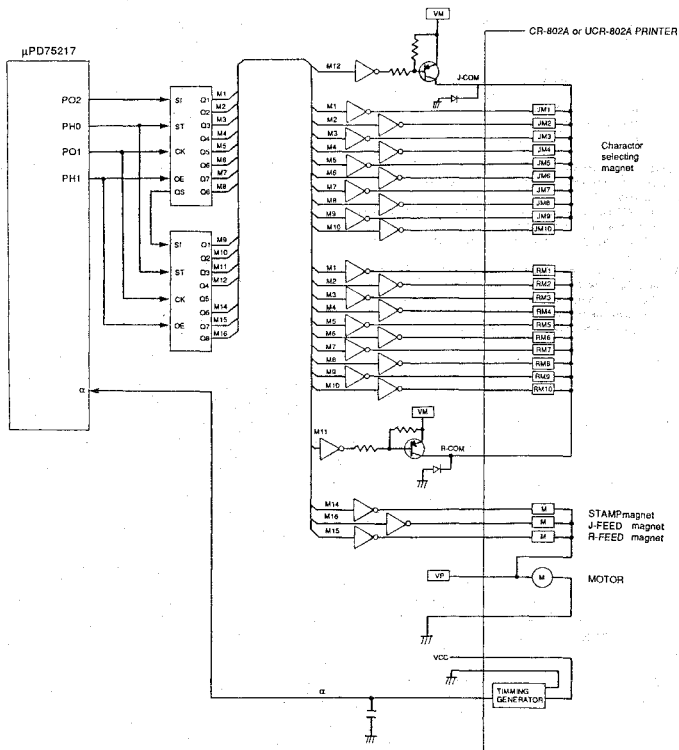
Fig. 2-8

PO2	:	Print data output (serial output)
PO1	:	Print data shift clock
PH0	:	Printer magnet data strobe signal
PH1	:	Printer magnet data output enable signal
M1		
	:	Print magnet drive signal
M10		
VP	:	Printer power
α	:	Printer timing signal
M11	:	Receipt side magnet common
M12	:	Journal side magnet common
M14	:	STAMP drive
M15	:	Receipt feed
M16	:	Journal feed

TC4094 internal circuit

(TOP VIEW)
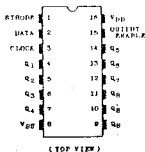
Printer control procedure

Printer is controlled mainly with CPU signals PH0, PH1, PO1, PO2, α, and P22.

1) Make P22 high to drive the motor with the CPU. This activates VP to rotate the printer motor.

2) α (Timing Signal) from the printer allows output of the first line print data.

3) Print data is outputted serial-parallel converted in TC4094 and internally latched by the strobe signal of PH0.
   When PH1 output enable signal is inputted. The latched data is outputted as M1~M16.

4) The next α is detected and procedure 3) is repeated.

Timing

— 10 —
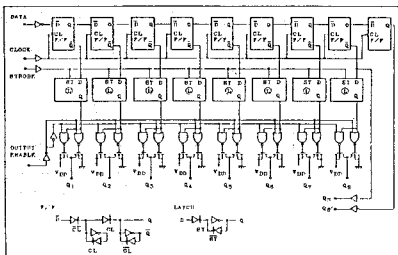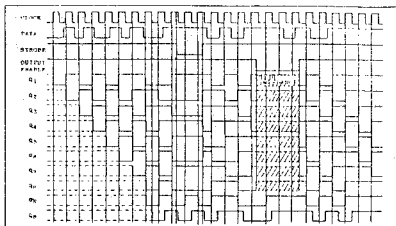
7) Printer motor drive circuit

BLOCK diagram
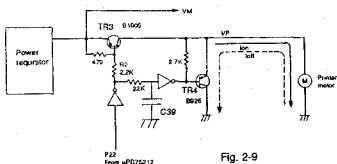
Fig. 2-9

A high on P22 of the μPD75212 makes TR3 active and TR4 inactive so that current flows through the motor to run. On the other hand, a low on P22 turns off TR3 and turns on TR4 stop the motor.

8) Drawermagnet drive
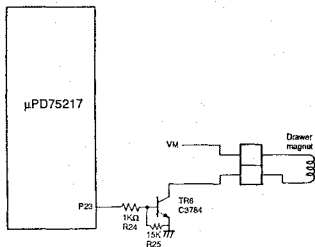
Fig. 2-10

The drawer magnet isdriven when P23 of the μPD75212 changes from low to high state

9) Power circuit

(1) Block diagram
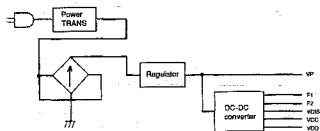
Fig. 2-11

VP	:	+20V
VF1, VF2	:	-4.3V AC
VDISP	:	-25V
VCC	:	+5V
VDD	:	+5V

(2) Regulator circuit
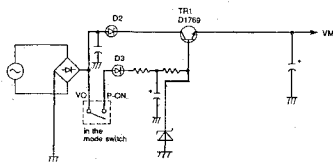
Fig. 2-12

1) If VO-P-ON was not shorted within the mode switch (power off), TR1 remains inactive as no voltage is applied to the base of TR1.

2) If VO-P-ON was shorted, TR1 goes active as voltage is added to the base of TR1.

3) With activation of TR1, the voltage VM begins to increase.

(3) DC-DC converter
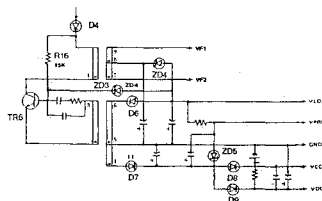
Fig. 2-13

The bias is added to the base of TR5 when the power switch is turned on, so that TR5 starts self-oscillation. VLOAD from the secondary side is fed back through the zener diode ZD3 to suppress voltage fluctuation on the secondary side.
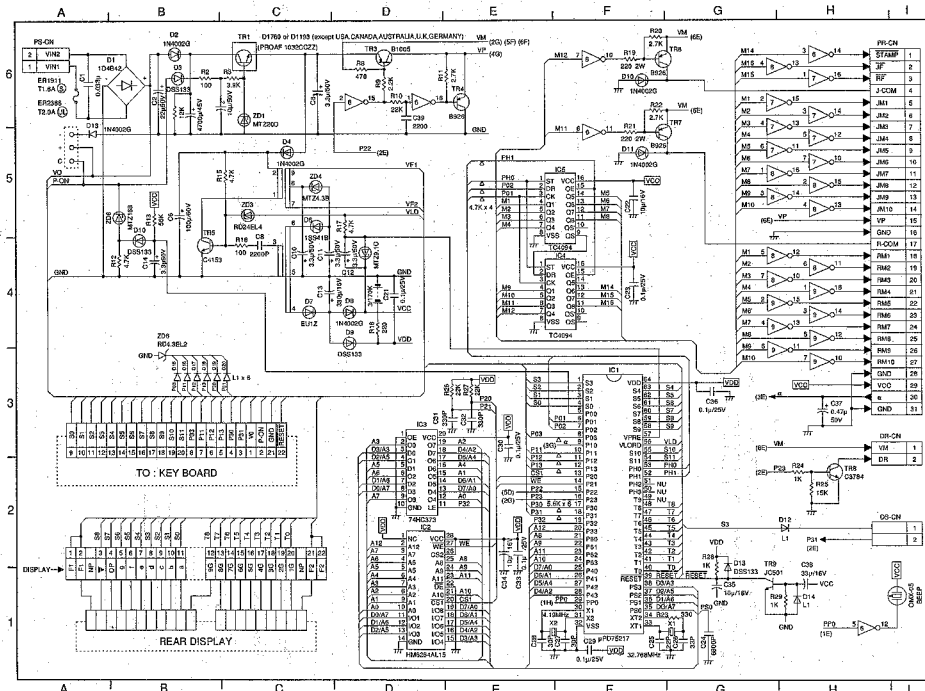
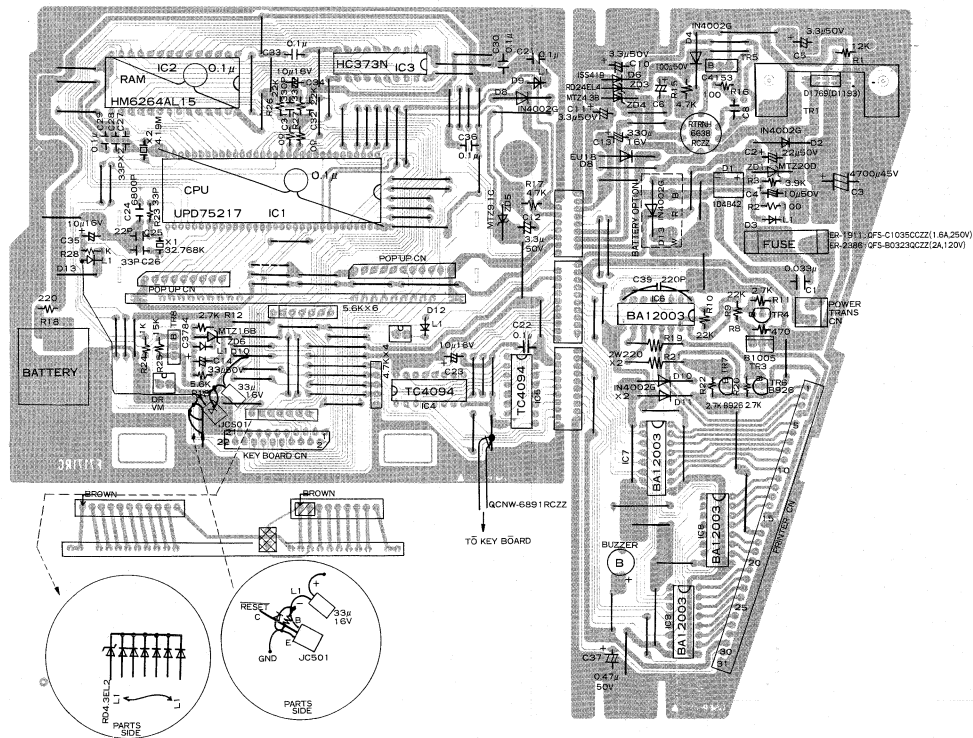## 3-1 Main PWB circuit

3-2 Keyboard circuit
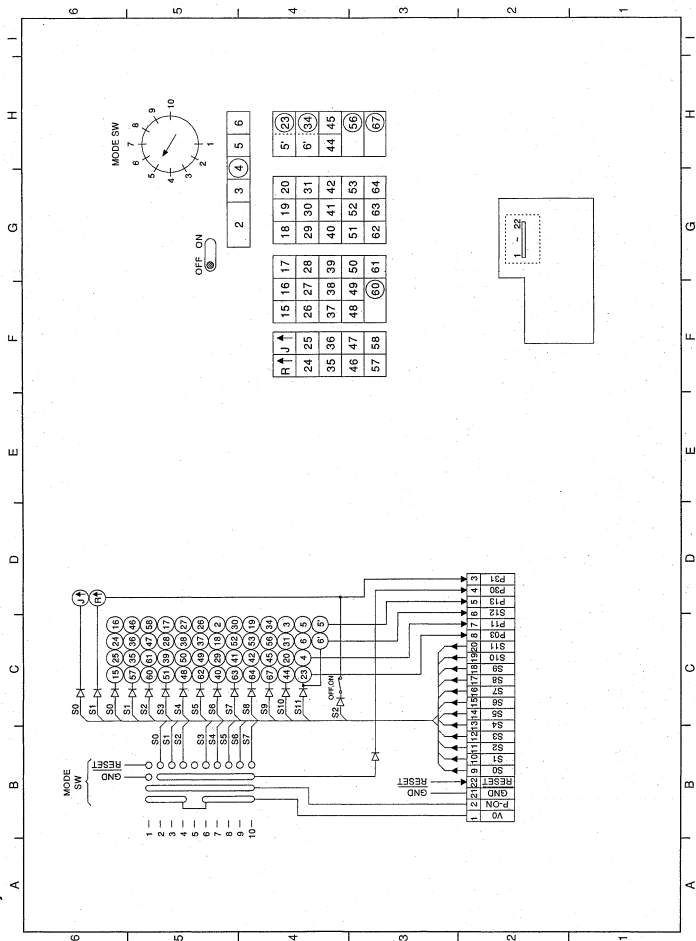
II. ER-1921/2396
1. TEST FUNCTIONS (ER-1921/2396)
1-1. Start of test function
The following key operation is required in the SRV1 mode to start the test.

$$\underset{\text{Test command}}{\underline{XXXX}} \rightarrow \boxed{TL} \text{ or } \boxed{CA/AT}$$

Master reset is required when the system is to be started for the first time.

1-2. List of test commands

Test No.	Test command	Test description
1	1	Clerk/Mode switch test
2	XXXX02 *1	Keyboard test
3	3	Display and buzzer test
4	4	Receipt ON/OFF switch test
5	5, 6, 7, 8	Drawer open test (The code 6 to 8 are for optional drawers)
6	9	Continuous print tes
7	10, 11	ROM test
8	13	RAM test
9	14	Key position code test
10	XXXX00 *1	Sequential test-1
11	XXXX22 *1	Sequential test-2 (drawer open sensor disregarded)

Note: *1XXXX: Sum check data for standard key layout
ER-1921 → 1519
ER-2396 → 1589

NOTE-1: Test message is printed on both the receipt and journal
NOTE-2: The contents of the totalizer and the preset values are not erased by the test.

Test function
1) Test No.1: Clerk and mode switch test
① Key operation
Push the clerk switch → clerk switch E.

$$1 \rightarrow \boxed{TL} \text{ or } \boxed{CA/AT}$$

Then, push the clerk and mode switches in the following order.

Clerk and mode switch operation	Display
Clerk SW. A	0 1
Clerk SW. B	0 2
Clerk SW. D	0 4
Clerk SW. E	0 8
Mode SW PGM	0 1
▧ or VOID	0 2
⏻ or OFF	0 3
OPX/Z or TIME	0 4
REG	0 5
X1	0 6
Z1	0 7
X2/Z2	0.0 0
SRV1	0.0 0

② Description
As the clerk and mode switch position number is displayed check the number.
③ Termination
The test can be terminated when the mode switch is turned to the SRV1 side from other position.
Termination print at error ---------01E

Termination print at normal end   01

2) Test No. 2: Keyboard
① Key operation

$$\underset{\text{Sum check data}}{\underline{X \ X \ X \ X}} \ \underset{\text{Test command}}{\underline{0 \ 2}} \rightarrow \boxed{TL} \text{ or } \boxed{CA/AT}$$

(1) Enter the test command in succession to the sum check data of the model.

Model	Sum check data (standard key layout)
ER-1921	1519*
ER-2396	1589*

* NOTE: Sum check data
The check sum is a decimal number obtained by converting of the hard code hexadecimal total of all keys.
The $\boxed{TL}$ and $\boxed{CA/AT}$ keys are exception.
(2) Next, push every key on the keyboard except for the receipt and journal keys.
When the [TL] or [CA/AT] key is depressed, the termination printout is immediately produced assuming that all keys have been depressed.
There is no order in which the keys have to be depressed.

[Keyboard position code of model vs. key to be depressed]
[All key position code]

Fig. 1

			3D	35	39	1A	3A	2A
			3E	1E	3B	0C	1C	1D

↑ R	↑ J		0F	3F	32	25	37	19	1B	3C	0A
2F	1F		34	33	22	15	36	29	2B	2C	38
10	20		24	23	12	05	16	17	0B	09	18
30	21		03	14	13	02	26	27	2E	2D	28
00	31			01	11	04	06	07	0E	0D	08

Fig. 2

					35	39	1A	3A	2A

R↑	J↑	0F	3F	32	25	37	19	3C	0A
2F	1F	34	33	22	15	36	29	2C	38
10		24	23	12	05	16	17		18
30	21	03	14	13	02	26	27		28
00	31		01	11	04	06	07		TL

[ER-2396]

Fig. 3

		3D	35	39	1A	3A	2A

R↑	J↑	0F	3F	32	25	37	19	3C	0A
2F	1F	34	33	22	15	36	29	2C	38
10	20	24	23	12	05	16	17	09	18
30	21	03	14	13	02	26	27		28
00	31		01	11	04	06	07		CA/AT

② Description
Until the depression if the [TL] or [CA/AT] key, the sum of key position codes is compared with the sum check data, except for the [TL] or [CA/AT] key.

③ Termination
The test terminates with the depression of the [TL] or [CA/AT] key and the termination printout is produced.

Termination printout   02

†Termination printout with error ------- 02E

3) Test No. 3: Display buzzer test

① Key operation

3 → TL or CA/AT

② Description
Continuous beeps and display are tested.
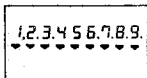
```
1.2.3.4 5 6.7.8.9.
▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼
```
State of display

③ Termination
The beep stops with any key depression and the display returns to show 0.00
Termination print   03

4) Test No. 4: Receipt on/off switch test

① Key operation

4 → TL or CA/AT

② Description
The following is displayed according to the location of the receipt on/off switch.

	Display
Receipt off (contacts closed)	C
Receipt on (contacts open)	0
End	0

③ Termination
With depression of any key, the display shows 0.00
Termination print   04

5) Test No. 5: Drawer open test (Must have drawer open sensor kit installed)

① Key operation

X → TL or CA/AT

X	Test description
5	Standard drawer : A
6	Option drawer : B
7	Option drawer : D
8	Option drawer : E

② Description
With this test, the drawer opens and its state is displayed in the following manner:
Drawer open → 0
Drawer closed → C
"C" is displayed for the model that has no drawer sensor switch.

③ Termination
With depression of any key, the display shows 0.00
Termination print   0X
                              └ Test No. 5, 6, 7, 8

6) Test No. 6: Continuous print test

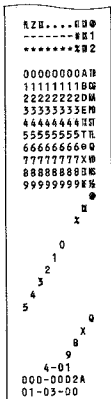① Key operation

9 → TL or CA/AT

② Description
Receipt switch at OFF: Continuous printing is done.
Receipt switch at ON: After a cycle of printing, the operation terminates automatically.
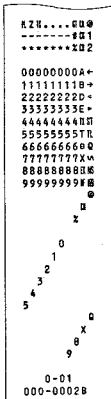
③ Termination

When the receipt switch is turned from OFF to ON position while printing is continuing, the test termination after a cycle of printing.

ER-2396

```
R ZH . . . . @ 月 @
- - - - - - - 月 1
* * * * * * * 万 月 2

0 0 0 0 0 0 0 0 A 𝕀
1 1 1 1 1 1 1 B 卬
2 2 2 2 2 2 2 D 卬
3 3 3 3 3 3 3 E 印
4 4 4 4 4 4 4 H 卬
5 5 5 5 5 5 5 T 几
6 6 6 6 6 6 6 0 Q
7 7 7 7 7 7 X 卬
8 8 8 8 8 8 8 N%
9 9 9 9 9 9 K %
                  ⊗
                  𝕀
                  𝕩
             0
           1
          2
         3
        4
       5           Q
                  𝕩
                8
               9
         4 - 0 1
       0 0 0 - 0 0 2 A
     0 1 - 0 3 - 0 0
```

ER-1921

```
R ZH . . . . @ 月 @
- - - - - - - 月 1
* * * * * * * 万 月 2

0 0 0 0 0 0 0 0 A ←
1 1 1 1 1 1 1 B →
2 2 2 2 2 2 2 D ←
3 3 3 3 3 3 3 E ←
4 4 4 4 4 4 4 H ←
5 5 5 5 5 5 5 T 几
6 6 6 6 6 6 6 0 Q
7 7 7 7 7 7 X 卬
8 8 8 8 8 8 8 N 卬
9 9 9 9 9 9 K 卬
                  ⊗
                  𝕀
                  𝕩
             0
           1
          2
         3
        4
       5           Q
                  𝕩
                8
               9
         0 - 0 1
       0 0 0 - 0 0 2 B
```

7) Test No. 7: ROM test

① Key operation

CPU internal system ROM (0000H ~ 0FFFH)

10 → TL or CA/AT

CPU internal application ROM (8000H ~ FF7FH)

11 → TL or CA/AT

② Test results

Termination print

Normal end	At error
1 0	- - - - - - 1 0 E
1 1	- - - - - - 1 1 E
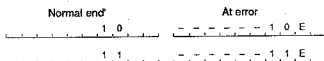
8) Test No. 8: RAM test

① Key operation

② Description

Though read/write test is conducted from the address 60000H to 7FFFH, the data is secured by saving it before the test starts.

③ Test results   Termination print

At normal end →   ⎯⎯⎯ 1 3 ⎯⎯⎯

Error →   ⎯⎯⎯ 1 3 E ⎯⎯⎯
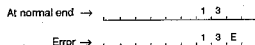
NOTE: If the CPU internal software timer interrupt was received in a course of data write or read (verify) during this test mode, it may affect the data and an error max occur. Since the problem could occur only with this test program, there is no problem to the application software.

9) Test No. 9: Key position code read test

① Key operation

② Description

Key position of a key on the keyboard is displayed when any key is depressed. (Hardware key contacts code. A hexadecimal number is converted into a decimal number before displayed.)

The receipt and journal keys only feed paper without displaying, and the TL or CA/AT key is used to terminate the test.

For key position codes displayd, refer to Fig.1 to 3.

③ Termination

Push the TL or CA/AT key.

Termination print   14

10) Test No. 9: Sequential test-1

① Key operation

X , X , X , X , 0 0 → TL or CA/AT

Refer to 2) test No.2 for the sum check data.
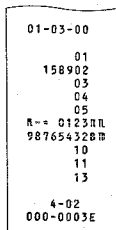
② Description

Within one second after the key operation, the test nos 1 thru 8, are able to carry out continuously.

NOTE-1: If a drawer sensor is equipped for test No. 5, the control proceeds to a next step when the drawer is closed after it was opened. If the sensor is not equipped, the control jumps to a next step assuming it has no drawer is installed.
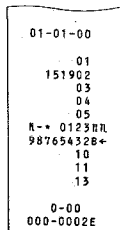
NOTE-2: Simple print is done for the continuous print test of test No. 6.

[A print example after the test]

ER-2396

```
0 1 - 0 3 - 0 0

      0 1
    1 5 8 9 0 2
      0 3
      0 4
      0 5
R ~ = 0 1 2 3 几 几
9 8 7 6 5 4 3 2 B 卬
      1 0
      1 1
      1 3

    4 - 0 2
  0 0 0 - 0 0 3 E
```

ER-1921

```
0 1 - 0 1 - 0 0

      0 1
    1 5 1 9 0 2
      0 3
      0 4
      0 5
R - = 0 1 2 3 几 几
9 8 7 6 5 4 3 2 B ←
      1 0
      1 1
      1 3

    0 - 0 0
  0 0 0 - 0 0 2 E
```

* The upper four digits shows the sum of key position codes which have been pressed in the key switch test.

③ Termination

All tests automatically terminate upon finishing the stamp test.

11) Test No. 11: Sequential test-2

① Key operation

X , X , X , X , 2 2 → TL or CA/AT

         └──────── Refer to 2) test No.2 for the sum check data.

② Description

It is similar as the test No. 10 except that it ignores the drawer open test No. 5.

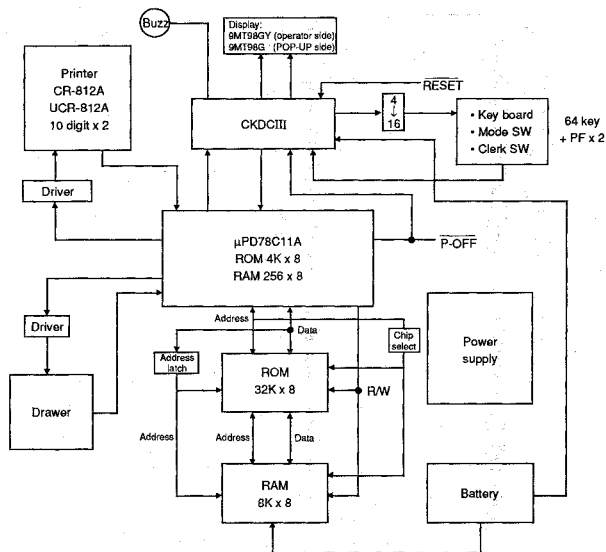## 2. CIRCUIT DESCRIPTION (ER-1921/ER-2396)

Circuit block diagram

Fig. 2-1

2-2. CPU pin description

1) CPU (μPD78C11A)

The μPD78C11A is a single chip microprocessor which has an internal ROM, RAM, and serial I/O.

Pin configuration

PA0	1	64	VDD
PA1	2	63	STOP
PA2	3	62	PD7
PA3	4	61	PD6
PA4	5	60	PD5
PA5	6	59	PD4
PA6	7	58	PD3
PA7	8	57	PD2
PB0	9	56	PD1
PB1	10	55	PD0
PB2	11	54	PF7
PB3	12	53	PF6
PB4	13	52	PF5
PB5	14	51	PF4
PB6	15	50	PF3
PB7	16	49	PF2
TXD	17	48	PF1
PXD	18	47	PF0
SCK	19	46	ALE
INT2	20	45	WR
PC4	21	44	RD
PC5	22	43	AVDD
PC6	23	42	VAREF
PC7	24	41	AN7
NMI	25	40	AN6
INT1	26	39	AN5
MODE1	27	38	AN4
RESET	28	37	AN3
MODE0	29	36	AN2
X2	30	35	AN1
X1	31	34	AN0
GND	32	33	AVSS

Fig. 2-2

2) Signal description

Pin No.	Port name	Signal name	I/O	Description
1	PA0	MG10 & DRA	O	Printer magnet 10 & rawer open signal A
2	PA1	MG9 & DRB	O	Printer magnet 9 & rawer open signal B
3	PA2	MG8 & DRD	O	Printer magnet 8 & rawer open signal D
4	PA3	MG7 & DRE	O	Printer magnet 7 & rawer open signal E
5	PA4	MG6	O	Printer magnet 6
6	PA5	MG5	O	Printer magnet 5
7	PA6	MG4	O	Printer magnet 4
8	PA7	MG3	O	Printer magnet 3
9	PB0	MG2	O	Printer magnet 2
10	PB1	MG1	O	Printer magnet 1
11	PB2	R-COM	O	Receipt common signal
12	PB3	J-COM	O	Journal common signal
13	PB4	R-FEED	O	Receipt feed signal
14	PB5	J-FEED	O	Journal feed signal
15	PB6	STAMP	O	Stamp signal
16	PB7	MOTORDRIVE	O	Motor drive signal
17	TXD	HTS	O	8-bit serial output (CKDCIII)
18	RXD	STH	I	8-bit serial input (CKDCIII)
19	SCK	SCK	I	Shift clock (CKDCIII)
20	INT2	SHEN	I	Shift enable (CKDCIII)
21	PC4	SCK	I	Shift clock (CKDCIII)
22	PC5	IRQ	I	Interrupt request to host
23	PC6	STOP	O	System reset request signal
24	PC	P-OFF	O	Power off signal
25	NMI	VCC	I	Not used
26	INT1	α	I	α signal
27	MODE1	VCC pull up	I	VCC pull up signal
28	RESET	SRES	I	Reset input
29	MODE0	GND	I	GND
30	X2	X2	–	12MHz oscillator
31	X1	X1	–	12MHz oscillator
32	VSS	GND	I	GND
33	AVSS	GND	I	GND
34	AN0	DS	I	Drawer sensor
35	AN1	NU	I	
⟨	AN1	⟨	⟨	Not used
41	AN7	NU	I	
42	VAREF	VDD	I	VDD
43	AVDD	VDD	I	VDD
44	RD	RD	O	Read signal
45	WR	WR	O	Wright signal
46	ALE	ALE	O	
47	PF0	AB8	O	Address bass, A8
48	PF1	AB9	O	Address bass, A9
49	PF2	AB10	O	Address bass, A10
50	PF3	AB11	O	Address bass, A11
51	PF4	AB12	O	Address bass, A12
52	PF5	AB13	O	Address bass, A13
53	PF6	AB14	O	Address bass, A14
54	PF7	AB15	O	Address bass, A15
55	PD0	DB0/AB0	I/O	Address bass, A0 Data bass, D0
56	PD1	DB1/AB1	I/O	Address bass, A1 Data bass, D1
57	PD2	DB2/AB2	I/O	Address bass, A2 Data bass, D2
58	PD3	DB3/AB3	I/O	Address bass, A3 Data bass, D3
59	PD4	DB4/AB4	I/O	Address bass, A4 Data bass, D4
60	PD5	DB5/AB5	I/O	Address bass, A5 Data bass, D5
61	PD6	DB6/AB6	I/O	Address bass, A6 Data bass, D6
62	PD7	DB7/AB7	I/O	Address bass, A7 Data bass, D7
63	STOP	VCC	I	VCC
64	VDD	VCC	I	VCC

* PB6: High, PB7: Low → Drawer drive signal

2-3. CKDC.III (HD404708) Description

1) Outline

The LSI is a 4bit microprocessor developed for the use in the ER-1921/2396. It controls real time clock, key and display. Its basic functions are described below:

KEY: Controls max. 253 momentary keys.
(Sharp 2-key roll over control)
Simultaneous read of key and switch is possible.
(When key is read, the states of mode, clerk, switch are also buffered. The host can read key and key data simultaneously.

Switch: Mode switch up to 14 positions.
8 bit clerk (casher) switch
2 bit feed switch
1 bit receipt on/off switch
1 bit option switch
4 bit general purpose switch (1 bit is used for key board selection.)

Display: 16 digit dot display
12 digit, 7-segment display (Display digit can be selected).
Decimal point of dot, 7-segment display, indicator
Blining control is possible for all digits.
7 segment programmable pattern: 4 patterns
7 segment display driver included.

Buzzer: One tone control

Clock: Year, Month, Day, Day, of week, o/clock, minute

Alarm: O'clock, minute

Interrupt request (event control):
Key input, switch state change, alarm generation, counter overflow detection are available.

2) System diagram
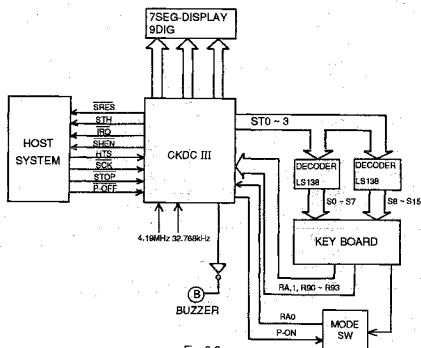
Fig. 2-3

3) Pin Assignment

Pin No.	Port	I/O	Signal name	Notes
1	R01	O	B	SEG-B
2	R02	O	C	SEG-C
3	R03	O	D	SEG-D
4	R10	O	E	SEG-E
5	R11	O	F	SEG-F
6	R12	O	G	SEG-G
7	R13	O	–	NOT USED
8	R20	O	–	NOT USE
9	R21	O	–	
10	R22	O	DP	DP
11	R23	O	▼	ID
12	RA0	I	MODER	MODE RETURN from KEY BOARD UNIT
13	RA1	I	CFSR	CLEARK, FEED, SWITCH: RETURN from KEYBOARD
14	R30	O	–	NOT USE
15	R31	O	–	
16	R32	O	–	
17	R33	O	–	
18	R50	O	ST0	ST0
19	R51	O	ST1	ST1
20	R52	O	ST2	ST2
21	R53	O	ST3	ST3
22	INT1	I	POFF	P-OFF signal input
23	INT2	I	STOP	/STOP request signal from HOST CPU input
24	R62	O	SHEN	/SHENoutput
25	R63	O	IRQ	/IRQ output
26	Vcc	I	VDD	Power supply
27	SCK	I	SCK	/SCK input
28	SI	I	HTS	HTS
29	SO	O	STH	STH
30	R43	I	–	NOT USED
31	BUZZ	O	BUZZ	BUZZER
32	R71	O	–	NOT USE

Key SCAN timing signal (to KEY UNIT) — for ST0, ST1, ST2, ST3

Pin No.	Port	I/O	Signal name	Notes
33	R72	O	SRES	SYSTEM RESET
34	R73	O	–	NOT USE
35	R80	O	–	
36	R81	O	–	
37	R90	I	R90	KEY RETURN INPUT from KEY UNIT
38	R91	I	R91	KEY RETURN INPUT from KEY UNIT
39	R92	I	R92	KEY RETURN INPUT from KEY UNIT
40	R93	I	R93	KEY RETURN INPUT from KEY UNIT
41	RESET	I	RESET	CKDC III RESET
42	OSC2	I		4.19MHz OSC
43	OSC1	I		
44	GND	—		GND
45	CL1	I		32.768KHz X'tal
46	CL2	I		
47	TEST	I	VDD	+5V
48	D0	O	–	NOT USED
49	D1	O	–	
50	D2	O	–	
51	D3	I	–	
52	D4	O	–	
53	D5	O	–	
54	D6	O	–	
55	D7	O	G1	7SEG DIG1
56	D8	O	G2	7SEG DIG2
57	D9	O	G3	7SEG DIG3
58	D10	O	G4	7SEG DIG4
59	D11	O	G5	7SEG DIG5
60	D12	O	G6	7SEG DIG6
61	D13	O	G7	7SEG DIG7
62	D14	O	G8	7SEG DIG8
63	D15	O	G9	7SEG DIG9
64	R00	O	A	SEG-A

2-4. Clock generator

The basic pulse circuit is not provided in the ER-1921/2396 itself. An independent oscillation circuit is provided in each device (CPU, CKDC-III)

1) µPD7811A CPU oscillation circuit (main-PWB)
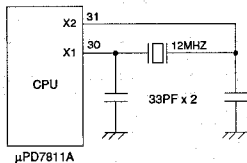
Fig. 2-4

Basic clock is supplied from a 12MHz ceramic oscillator.
The CPU contains an oscillation circuit from which the basic clock is internally derived. If the CPU was not operating properly, the signal dose not appear on this line in most cases.

2) HD4708A73FS CKDC-III oscillation circuit
(Display-PWB)
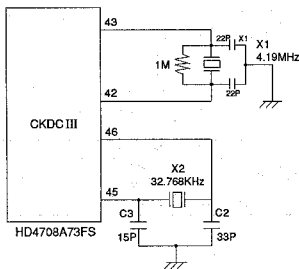
Fig. 2-5

Two oscillators are connected to the CKDC-III.
The main clock X1 generates 4.19MHz which is used during power on.
When the power is turned off or when the MODE switch is set to the OFF position, the CKDC-III goes into the standby mode and the main clock stops.
The sub-clock X2 generates 32.768KHz which is primarily used to update the internal RTC (real time clock). During the standby mode, it keeps oscillating to update the clock and monitoring the power recovery.

2-5. P-OFF circuit
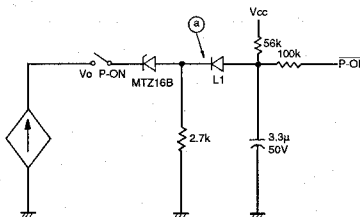
Fig. 2-6

At power on
When P-ON voltage reaches 16V, the current flows through the zener diode (MTZ16B) so that the level at point @ goes high.
The level of P-OFF rises as VCC increases. As a result, the P-OFF signal changes from low to high level.

At power off
When the power is turned off, the P-ON voltage drops under 15V causing the zener diode to stop current flow, which causes potential at point @ to drop.
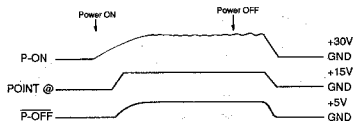
Fig. 2-7

2-6. Reset circuit

Fig. 2-8

Fig. 2-11
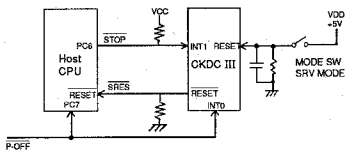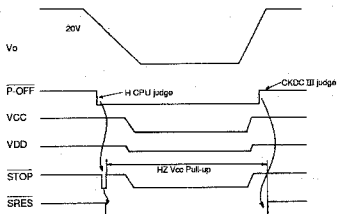
i) When the host CPU recognizes the power down signal, the reset request signal STOP (H → L) is issued to the CKDCIII after completing a series of power down procedure like saving memory contents and address.

When the CKDCIII recognizes the $\overline{STOP}$ signal (H → L), the reset signal $\overline{SRFS}$ is issued to the host CPU to go into the standby mode.

In the standby mode, the clock and calendar data are updated and wait for the power recovery signal.

ii) When the power supply resumes, the $\overline{P\text{-}OFF}$ signal is set high. When the CKDCIII recognizes the power restoration, the $\overline{SRES}$ signal is set high and cancels the reset state of the host CPU, and the program is resumed to run. After the host CPU sets I/O mode to ports, it then starts to execute the program immediately power was down.

2-7. Battery circuit
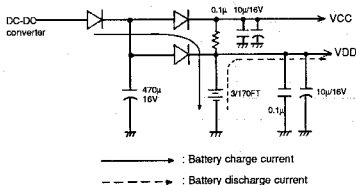
Fig. 2-9

2-8. Display control

The CKDCIII has an internal driver to directly drive the fluorescent display tube through the output line.
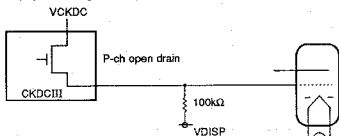
Fig. 2-10

The above figure is an example of the grid driver Gn. The segment driver has same circuit configuration.

The display tube employs a grid blanking dynamic drive and operates in the following timing.
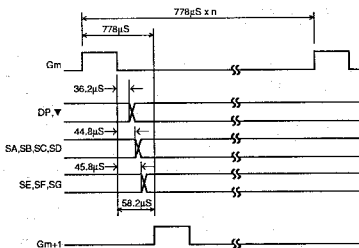
Printer control
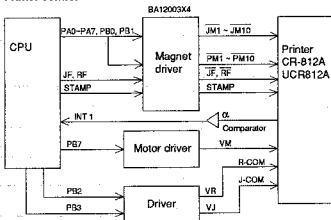
Fig. 2-12

Signal name		
JM1 ~ JM10	:	Journal magnet select signal
RM1 ~ RM10	:	Receipt magnet select signal
JF	:	Journal feed signal
RF	:	Receipt feed signal
STAMP	:	Stamp signal
α	:	Printer interface signal
VM	:	Motor drive signal
R-COM	:	Receipt common signal
J-COM	:	Journal common signal

Printer motor drive circuit

BLOCK diagram
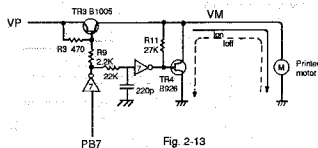
Fig. 2-13

A high on PB7 makes TR3 active and TR4 inactive so that current Ion flows through the motor to run. On the other hand, a low on PB7 turns off TR3 and turns on TR4 so that Ioff flows through the motor to stop the motor.

Drawer control

[Without option drawer]
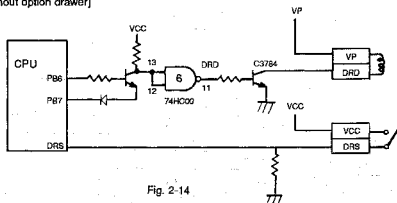
Fig. 2-14

The DRD signal output from the pin 11 of the 74 HC00 drives C378K
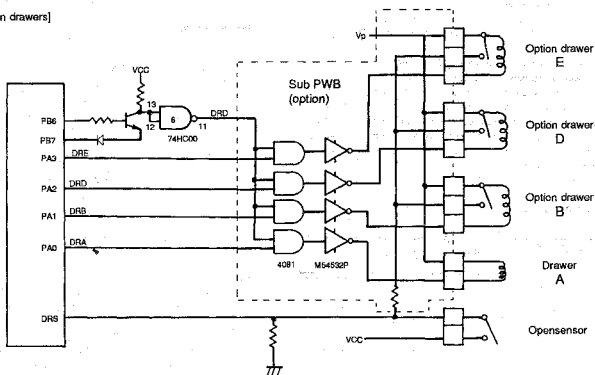to apply current to the drawer magnet.

[With option drawers]

Fig. 2-15

In case an optional drawer is in use, drawers are driven by the DRD
signal issued from the pin 11 of the 74HC00 and DRA through DRE.
A spark killer diode is cintained in the M54532P.
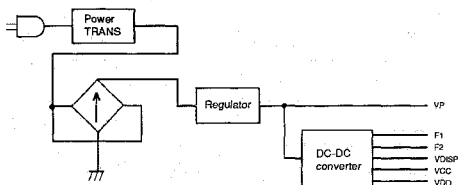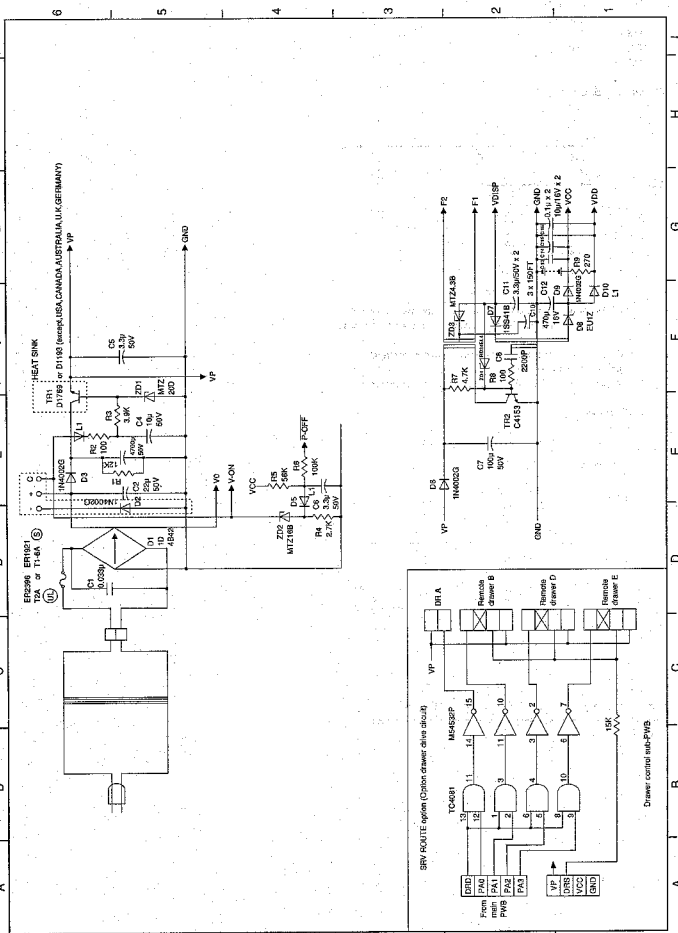
Power supply circuit

1) Block Diagram

Fig. 2-16

VP	:	+20V
F1	:	-4.3VAC
F2	:	-4.3VAC
VDISP	:	-25V
VCC	:	+5V
VDD	:	+5V

2) Regulator circuit

Fig. 2-17

1) If VO-P-ON was not shorted within the mode switch (power off), TR1 remains inactive as no voltage is applied to the base of TR1.
2) If VO-P-ON was shorted, TR1 comes active as voltage is added to the base of TR1.
3) With activation of TR1, the voltage VM begins to increase.

3) DC-DC converter

Fig. 2-18

The bias is added to the base of TR2 when the power switch is turned on, so that TR2 starts self-oscillation. VDISP from the secondary side is fed back through the zener ZD4 to sippress voltage fluctuation on the secondary side.

3-1. Main PWB circuit (1/2)

3-2. Main PWB circuit (2/2)

3-3. KEYBOARD CIRCUIT

3-4 Main PWB layout

Jumper a : ER-1921
Jumper b : ER-2396
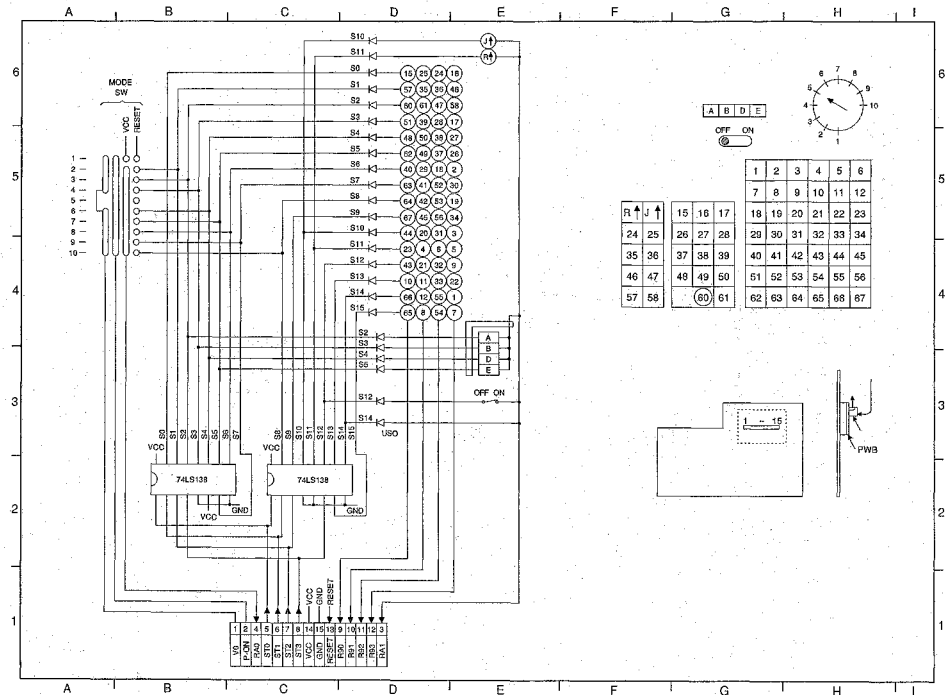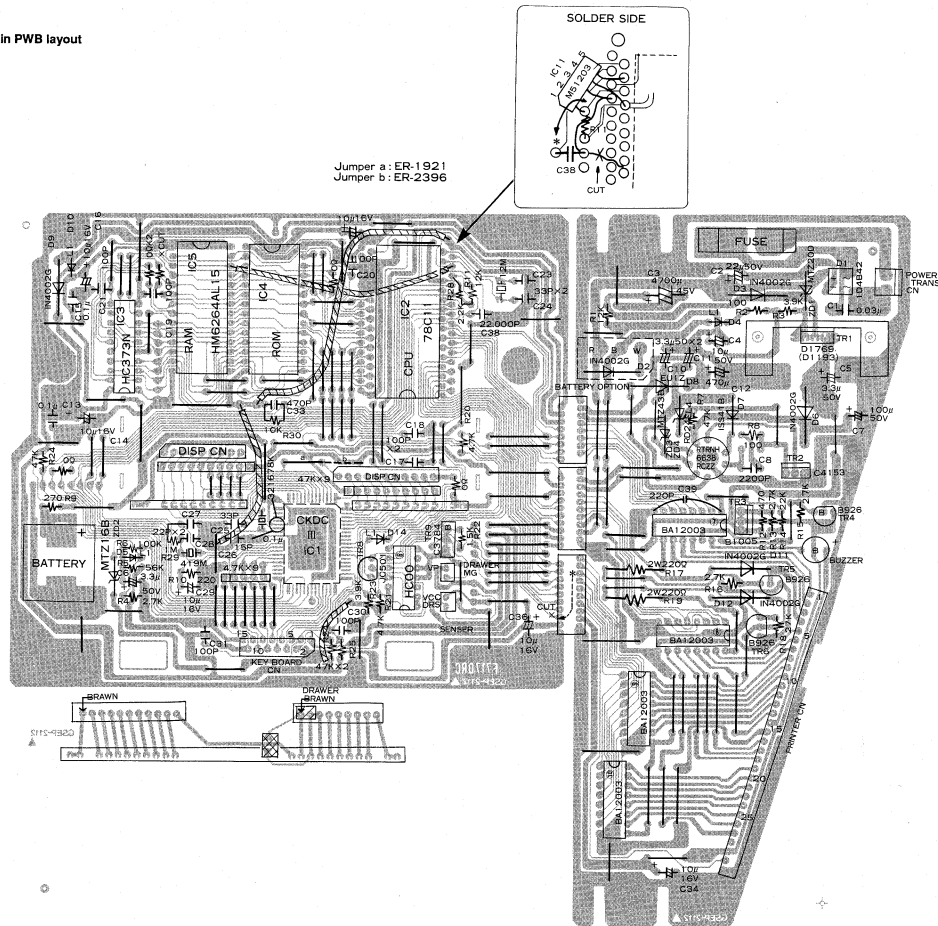
III. INSTALLATION MANUAL FOR OPTIONS

1. LIST OF OPTIONS (Sales route options)

1) For ER-1911

No.	Name	Model name	Germany	U.K.	Australia	Notes
1	Coin case	ER-35CC1	O	—	—	
		ER-38CC	—	—	O	
2	Coin case cover	ER-37CV1~5	O	O	—	
		ER-38CV1~5	—	—	O	
3	Key top kit	ER-11KT6	O	O	O	1 X 1 key top
		ER-12KT6	O	O	O	1 X 2 key top
		ER-22KT6	O	O	O	2 X 2 key top
		ER-11DK6	O	O	O	1 X 1 dummy key
		ER-51DK6	O	O	O	1 X 5 dummy key
4	Option battely	ER-20BT2	—	O	O	

2) For ER-1921

No.	Name	Model name	Germany	U.K.	Australia	Notes
1	Coin case	ER-19CC	O	—	—	
		ER-35CC1	—	O	—	
		ER-38CC	—	—	O	
2	Coin case cover	ER-19CV1~5	O	—	—	
		ER-37CV1~5	—	O	—	
		ER-38CV1~5	—	—	O	
3	Key top kit	ER-11KT6	O	O	O	1 X 1 key top
		ER-12KT6	O	O	O	1 X 2 key top
		ER-22KT6	O	O	O	2 X 2 key top
		ER-11DK6	O	O	O	1 X 1 dummy key
		ER-51DK6	O	O	O	1 X 5 dummy key
4	Option battely	ER-20BT2	O	O	O	

3) For ER-2386/ER-2396

No.	Name	Model name	ER-2386	ER-2396	Notes
1	Coin case	ER-35CC	O	O	
2	Key top kit	ER-11KT6	O	O	1 X 1 key top
		ER-12KT6	O	O	1 X 2 key top
		ER-22KT6	O	O	2 X 2 key top
		ER-11DK6	O	O	1 X 1 dummy key
		ER-51DK6	O	O	1 X 5 dummy key
3	Option battely	ER-20BT2	O	O	Except. U.S.A.

2. LIST OF OPTIONS (Service route options)

1) For ER-1911/ER-1921

No.	Name	Parts code	ER-1911	ER-1921	Notes
1	Remote drawer	GBOXD7048RCZZ	—	O	For Germany
		GBOXD7049RCZZ	—	O	For U.K.
		GBOXD7050RCZZ	—	O	For Australia
2	Drawer open sensor kit	DKIT-8325RCZZ	O	O	Excluding U.K.
3	Drawer fixing kit	DKIT-8633RCZZ	O	O	
4	Shield plate kit	DKIT-3381RCZZ	O	O	ER-1911 the bottom cabinet kit is required
5	Cashier key kit	DKIT-3383RCZZ	—	O	
6	SRV key	LKGIM7113RCZZ	O	O	Service key
7	Key cover	GCOVB6985RCZZ	O	O	
8	Remote drawer drive kit	DKIT-8323RCZZ	—	O	
9	OP key grip cover	LKGIM7126RCZZ	O	O	
10	Sub master key	LKGIM7129RCZZ	O	O	
11	Drawer bell kit	DKIT-8324RCZZ	O	O	

2) For ER-2386/ER-2396

No.	Name	Parts code	ER-2386	ER-2396	Notes
1	Remote drawer	GBOXD7010RCZZ	—	O	
2	Drawer open sensor kit	DKIT-8325RCZZ	O	O	
3	Drawer fixing kit	DKIT-8633RCZZ	O	O	
4	Shield plate kit	DKIT-3381RCZZ	—	O	
5	SRV key	LKGIM7113RCZZ	O	O	
6	Key cover	GCOVB6985RCZZ	O	O	
7	Blind cover	DKIT-8567RCZZ	O	O	
8	Remote drawer drive kit	DKIT-8323RCZZ	—	O	
9	OP key grip cover	LKGIM7126RCZZ	O	O	

3. INSTALLATION OF OPTIONS

3-1. Drawer fixing kit

The drawer fixing kit is used for securing the cash drawer when installing separately from the ECR main unit.
By using two of brackets, the drawer box can be protected from drifting especially when it is filled with coins.

1) Parts list
KIT CODE: DKIT-8633RCZZ

No.	Parts code	Description	Price rank	Q'ty
1	LBRC-2321RCZZ	Fixing bracket	AN	2
2	XTPSD40P16000	Tapping screw M4 x 16	AA	4
3	XBSSD40P16000	Flat head screw M4 x 16 (For remote drawer)	AA	2
4	XUSSD40P20000	Flat head screw M4 x 20 (For standard drawer)	AA	2
5	XBPSD40P22000	Screw M4 x 22	AA	4
6	XNESD40-32000	Nut M4 x 32	AA	4

2) Installation procedure

① Turn over the drawer bottom side and remove rubber footing at tow locations.

② Fasten the bracket together with the rubber footing using the pand head screw.

Pay attention for the installing direction of the bracket that the pan head screw can be inserted properly into the bracket.
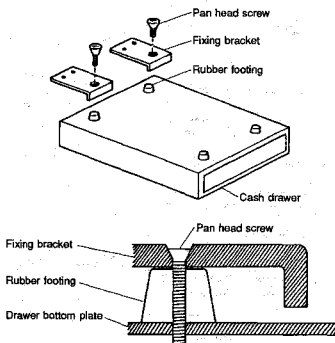

Fig. 3-1

③ Fastening on the table:

Secure the fixing Bracket using the screw (Fig. 3-2).

If the thickness of the table is less than 15mm, bore a 4.5mm hole in the table and fasten it with the screw (XBPSD40P22000 - 4 pcs.) and nut (XNESD40-32000 - 4pcs.)
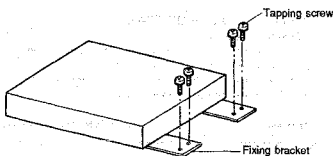
Fig. 3-2

3-2. Blind cover kit (For ER-2386/2396)

The blind cover kit is used for masking the open slot (located of the bottom side of the drawer box) of the drawer manual open lever.

1) Component parts   KIT CODE: DKIT-8567RCZZ

No.	Parts code	Description	Price rank	Q'ty
1	GITAR6732RCZZ	Blind cover plate	AK	1
2	XBPSD30P06KS0	Screw M3 x 6	AA	1

2) Installation procedure

① Secure the blind cover from the bottom side of the drawer by using a screw holding the drawer bottom plate by the washer.
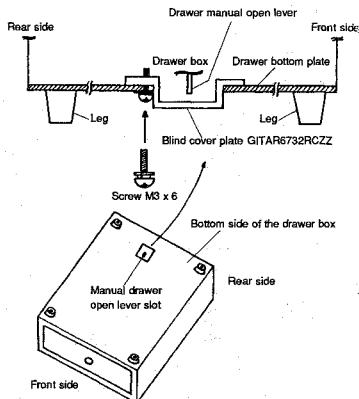
Fig. 3-3

3-3. Drawer removal procedure (For ER-1911/1921 and ER-2396)

1) Items required by models and destination

Model name	Items required		Destination
	Shild plate kit	Bottom cabinet	
ER-1921	DKIT-3381RCZZ	Installed on ECR	Europe, UK, Austria
ER-1911	DKIT-3381RCZZ	GCABA7081RCZZ	Europe, UK, Austria
ER-2396	DKIT-3381RCZZ	Installed on ECR	US and Canada

When removing the drawer from the ER-1911, the bottom cabinet kit is required in addition to the shield plate kit (DKIT-3381RCZZ).

2) Parts list

① Shield plate kit (DKIT-3381RCZZ)

Parts code	Description	Price rank	Q'ty	Remark
DUNTK9207RCZZ	Shild plate unit	AZ	1	
GLEGG6634RCZZ	Rubber foot	AB	4	
XUBSD30P14000	Screw	AA	4	For rubber foot
XWHSD30-05080	Washer	AA	4	For rubber foot
XUBSD30P08000	Screw	AA	1	For shild plate
XBPSD30P35KS0	Screw	AA	1	For installation of the ER-1911 transformer.
XFPSD30P20000	Screw	AA	1	For installation of the ER-1911 printer.
XWHSD30-05080	Washer	AA	1	For installation of the ER-1911 printer.
LX-BZ6756RCZZ	Screw	AA	1	For installation of the ER-1911 bottom cabinet.
XBPSD30P20KS0	Screw	AA	1	For installation of the ER-1911 ring core.
XNESD30-24000	Nut	AA	1	For installation of the ER-1911 ring core.
LBSHC6638RCZZ	Clamp	AA	2	
TLABS6871RCZZ	Inst manual	AE	1	*1

*1 From '90 Oct. production

② Bottom cabinet

No.	Parts code	Description	Price rank	Q'ty
1	GCABA7081RCZZ	Bottom cabinet	BA	1

3)Procedure

No.	Description	Applicable model ER-1921 ER-2396	Applicable model ER-1911	Parts name	Parts code
1	Remove three top cabinet holding screws.	○	○		
2	Remove the granding wire from the top of the drawer.	○	○		
3	Remove the ring core from the cabinet.		○		
4	Remove the top cabinet from the bottom cabinet. Remove the top cabinet from the drawer. Unfasten the transformer and drawer connectors.	○	○		
5	Remove two bottom cabinet holding screws.	○			
6	Remove the transformer holding screw.	○	○		
7	Remove the transformer cover from the drawer.		○		
8	Get the bottom cabinet ready. Use the bottom cabinet that equipped to the ER-1921 and ER-2396.	○	○	Bottom cabinet	GCABA7081RCZZ
9	Insert the wire of the drawer solenoid microswitch in the clamp and install the clamp to the shield plate. Note that there is a microswitch wire provided for use with the UK version model. Note: Even for the drawer with no microswitch it is necessary to install a clamp to the shield plate without fail. This means that two clamps must be installed without exception.	○	○	Clamp	LBSHC6638RCZZ
10	Route the solenoid microswitch connector through the square hole beneath the bottom cabinet.	○	○		
11	Place the shield plate under the back of the bottom cabinet, and fasten the rubber footings with screw at four locations and at a center.	○	○	Shield plate unit Rubber footing Washer Screw for rubber footing Screw	DUNTK9207RCZZ (QITAU67A5RCZZ) (TLABSK666RCZZ) GLEGG6634RCZZ XWHSD30-05080 XUBSD30P14000 XUBSD30P08000
12	Install the transformer cover to the rear right of the bottom cabinet and fasten the transformer with screws. (Use new screw for the ER-1911.)	○	○	Screw	XBPSD30P35KSO
13	Replace the top cabinet to the bottom cabinet. Fasten the transformer and drawer connectors as this point.	○	○		
14	Fasten the granding wire.	○	○		
15	Fasten the ring core. (Use new screw and nut.)		○	Screw Nut	XBPSD30P20KSO XNESD30-24000
16	Fasten the top cabinet with three screws. Use a new screw for the printer of the ER-1911 and for the rear in the rear left.		○	Screw, printer Screw, rear left	XFPSD30P20000 XWHSD30-05080 LX-BZ6756RCZZ

Tailor the drawer solenoid microswitch wire to the size the user wants. Use the AWG22 wire for this.

4) Setting
Master reset
While pressing the journal feed key, rotate the MODE switch from SRV2 to SRV1 position.

ER-1911

· Removal of the ER-1911 top cabinet transformer
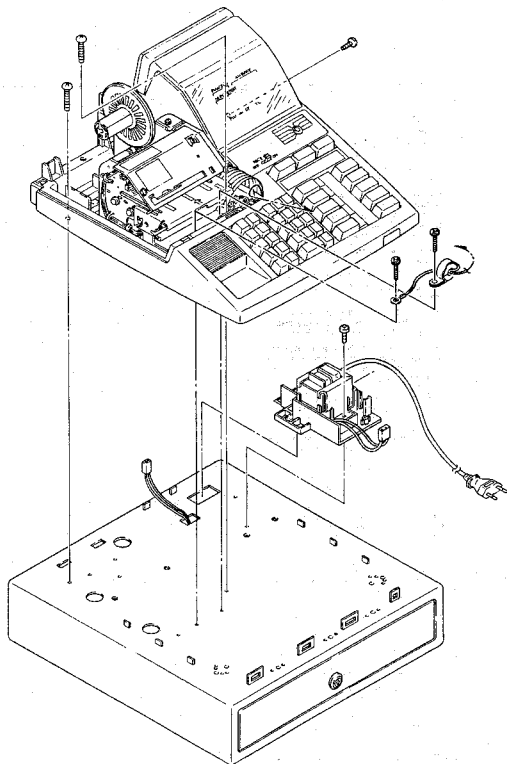
Fig. 3-4

ER-1911

- ER-1911 assembly procedure

Bottom cabinet
The bottom cabinet is not
equipped as standard for the
ER-1911

For solenoid

For microswitch

For drawer solenoid
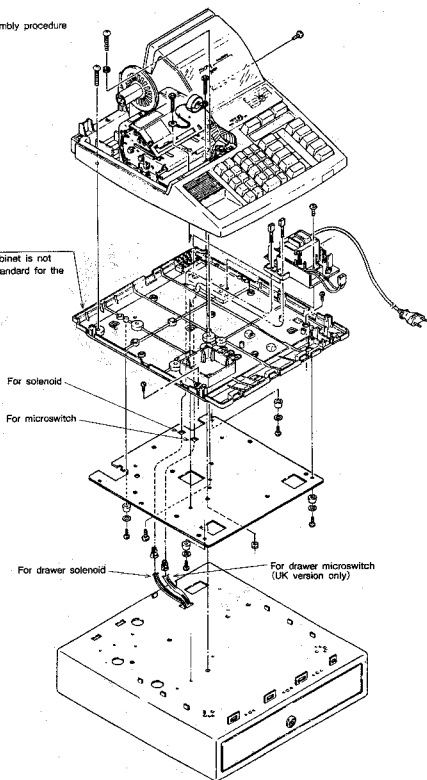
For drawer microswitch
(UK version only)

Fig. 3-5

ER-1921, ER-2396

- Removal of the ER-1921 and ER-2396 top cabinet, transformer, and bottom cabinet.
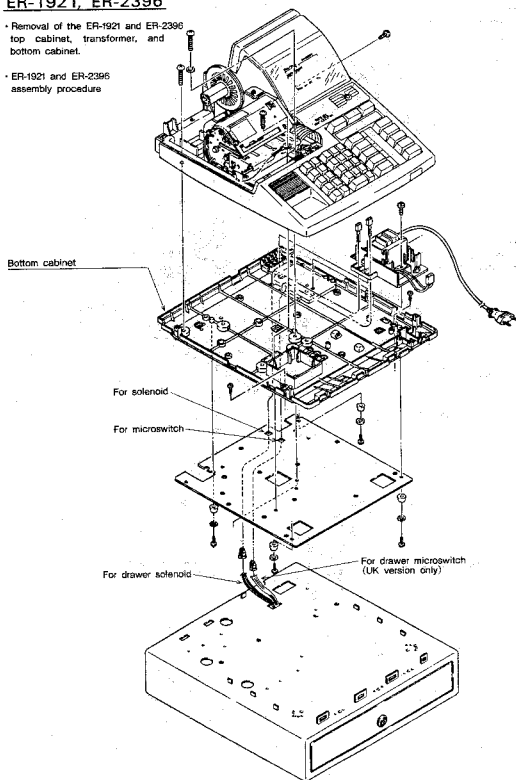
- ER-1921 and ER-2396 assembly procedure

Bottom cabinet

For solenoid

For microswitch

For drawer microswitch (UK version only)

For drawer solenoid

Fig. 3-6

3-4. Remote drawer and remote drawer drive kit for ER-1921 and ER-2396

1) Parts list

Remote drawer

No.	Parts code	Model	Country
1	GBOXD7048RCZZ	ER-1921	Germany
2	GBOXD7049RCZZ	ER-1921	U.K.
3	GBOXD7050RCZZ	ER-1921	Australia
4	GBOXD7010RCZZ	ER-2396	U.S.A.

DKIT-8323RCZZ

No.	Parts code	Description	Price rank	Q'ty
1	CPWBF7055RC01	Drawer PWB	AT	1
2	PSHEF6714RCZZ	Sheet	AC	1
3	PSPAY6643RCZZ	Spacer	AD	1
4	QCNCM6865RC0D	4-pin connector	DB	1
5	QCNCM6865RC0E	5-pin connector	DE	1
6	XUBSD30P08000	Screw M3 x 8	AA	6
7	XUPSD30P25000	Screw M3 x 25	AA	1

NOTE: Modification is needed in the drawer PWB to use the drawer drive kit (DKIT-8323RCZZ) for the ER-1921 and ER-2396.

(1) Modification method.
 ① First, remove the 4-pin and 5-pin connector cables that attached to the drawer PWB and replace them with the new cable.
  4-pin connecter cable: QCNCW6922RC03
  5-pin connecter cable: QCNCW6922RC04

 ② PWB layout

Drawer drive PWB
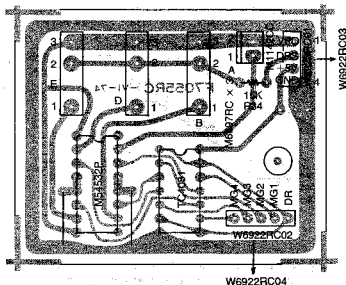
Connector cable for drawer drive PWB.

No.	Parts code	Price rank
1	QCNCW6922RC03	AG
2	QCNCW6922RC04	AH

Screw (M3x30) for install the drawer drive PWB.

No.	Parts code	Price rank
1	XUPSD30P30000	AA

2) Installation procedure
 ① Remove the top cabinet from bottom cabinet.
 ② Remove the keyboard from top cabinet.
 ③ Install the drive PWB unit on the keyboard.
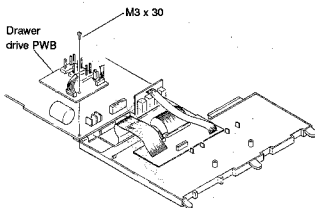
Fig. 3-7

 ④ Break throgh the cover located on the rear side of the bottom cabinet.

Break thurgh the cover
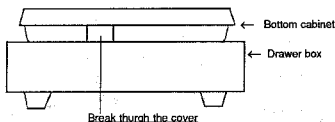
Fig. 3-8

 ⑤ Route the drawer cable through the cove located.
 ⑥ Connect the drawer cable to the drive PWB and the drive PWB cable to the main PWB.
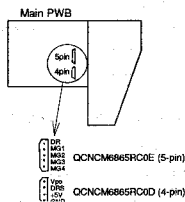
Fig. 3-9

⑦ Remove the option drawer cable holder at a on the bottom cabinet install the remote drawer cable with the cable holder.

M3 x 8
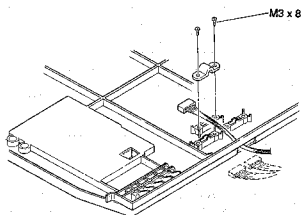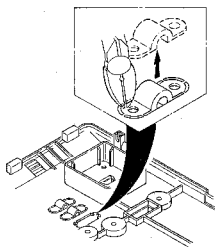
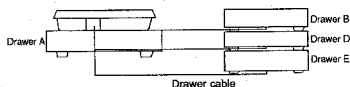Fig. 3-10

⑧ Install the keyboard and top cabinet.

Drawer B
Drawer A
Drawer D
Drawer E
Drawer cable

3-5. Cashier real key kit (one-hole key) only ER-1921
1) Parts list
DKIT-3383RCZZ

No.	Parts code	Description	Price rank	Q'ty
1	HDECA6810RCZZ	Decoration panel	AG	1
2	HDECA6811RCZZ	SW panel	AP	1
3	QCNCM6865RC0E	5-pin connector	AB	1
4	QCNW-7160RCZZ	Ground wire	AB	1
5	QSW-Z6851RCZZ	Key body with cable & key set	BA	1
6	XBPSD30P06000	Screw	AA	1
7	XFPSD30P06000	Screw	AA	1
8	GFTAB6754RCZA	Real key cover	AK	1

2) Installation procedure
① Remove the top cabinet from the bottom cabinet
② Remove the main PWB and keyboard unit from the top cabinet
③ Replace the connector of the keyboard PWB and insert the connector of the CLERK switch.
④ Remove the 4-row push CLERK switches which are found on the keyboard frame.
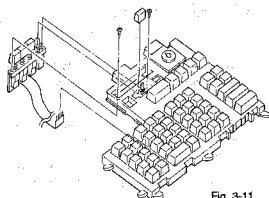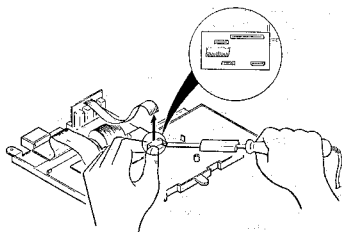
Fig. 3-11

⑤ Mount the keybody into the clerk key box on the bottom cabinet.
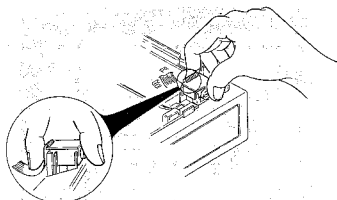
Fig. 3-12

⑥ Bond the switch panel (HDECA6811RCZZ) to the lower cabinet and fasten the ground strap with the screw.

⑦ When the drawer is connected.
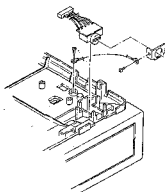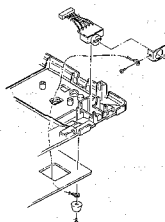

Fig. 3-13

⑧ When the drawer is separated.

Fig. 3-14

⑨ Replacement of the decolation panel.
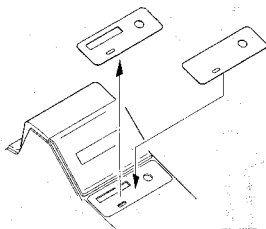Strip off the current mode switch panel and affix the mode switch panel (HDECA6810RCZZ) in place of the old one.

Fig. 3-15

⑩ Remove the clerk key hole cover located at the front and right side of the top cabinet.

⑩ Install the top cabinet
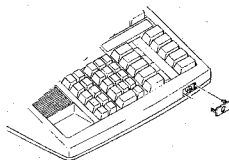⑪ Install the real key cover (GFTAB6754RCZA) to the top cabinet.

Fig. 3-16

3-6. Drawer bell and open sensor kit

3-6-1. Drawer bell kit

1) Parts list   DKIT-8324RCZZ

No.	Parts code	Description	Price rank	Q'ty
1	0AGRAL202MKSS	Bell	AC	1
2	0AGMLF230MKSS	Hammer unit	AC	1
3	0AGXBD806406N	Screw M4 x 6	AA	1
4	0AGXBD801408W	Screw M4 x 8	AA	1

2) Installation procedure
① Remove the drawer bottom plate by unscrewing the 4-screws.
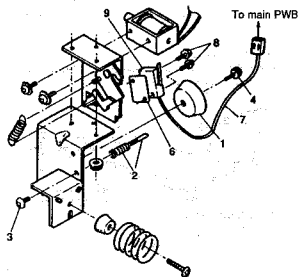② Install each component 1 to 4 as illustrated in Fig. 3.

Fig. 3-17

3-6-2. Drawer open sensor kit

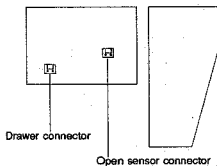1) Parts list   DKIT-8325RCZZ

No.	Parts code	Description	Price rank	Q'ty
5	QCNCM5035BCZZ	2-pin connector	AB	1
6	0AGPSP200MKSS	Spacer	AB	1
7	0AGQCW230MKSS	2-pin connector with wire	AE	1
8	0AGXBD202314X	Screw M3 x 14	AA	2
9	0AGOSW201MKSS	Micro switch	AM	1

Note: The 2-pin connector (No.5) has been already installed for the models ER-1910 and ER-1920. Therefore, skip the steps ② and ③ in the installation procedure. And the 2-pin connector is not used in this case.

2) Installation procedure

① Remove the top cabinet.

② Remove the main PWB and solder the 2-pin connector onto the main PWB.

ER-1911, ER-2386 Main PWB

Drawer connector

Open sensor connector
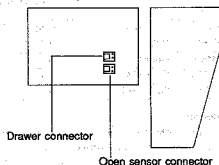
ER-1921, ER-2396 Main PWB

Drawer connector

Open sensor connector

Fig. 3-18

③ Replace the main PWB.

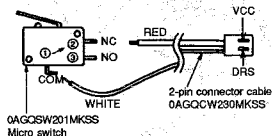④ Solder the 2-pin connector cable (0AGQCW230MKSS) to the micro switch as shown Fig.3-18.

0AGQSW201MKSS
Micro switch

2-pin connector cable
0AGQCW230MKSS

Fig.3-19

⑤ Remove the drawer bottom plate.

⑥ Mount the micro switch to the lock unit using the spacer and tooth screws. See Fig. 3-17. (No.6~9)

⑦ Draw the connector cable and put into the same hole used for the drawer cable, then insert to the connector.

⑧ Replace the drawer bottom plate and the top cabinet.

⑨ SRV programming (Job #913-D)
   Change the service preset value as it requires at SRV mode.

913-D: 1. Drawer closing operation
       2. Error system
       3. Key catch sound

1.Drawer closing operation	2.Error system	3.Key catch sound	913-D
Non compulsory	All lock error	Exist	0
		Not exist	1
	Mis-ope & lock error	Exist	2
		Not exist	3
Compulsory*	All-lock error	Exist	4
		Not exist	5
	Mis-ope & lock error	Exist	6
		Not exist	7

[Key operation]

913 → · → ⊗ or a/For → ABCD → TL

Set the D

3-7. Key top kit
1) List of key top kit

No.	Name	Description
1	ER-11KT6	1 x 1 key top
2	ER-12KT6	1 x 2 key top
3	ER-22KT6	2 x 2 key top
4	ER-11DK6	1 x 1 Dummykey
5	ER-51DK6	5 x 1 Dummykey

2) Installation procedure

① ER-11KT6

Key top (1 x 1)

Key spring

Key frame

Fig. 3-20

② ER-12KT6

Key top (1 x 2)

Key spring

Key frame

Fig. 3-21

③ ER-22KT6

- Key top
- Spacer
- Key spring
- Key frame

Fig. 3-22

④ Dummy key:

- Dummy key
- Key frame

3) Removing key top

- UKOG-6634RCZZ
- Key top
- Key spring
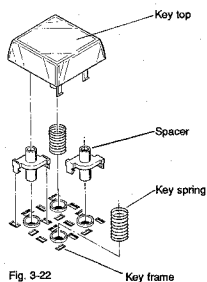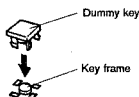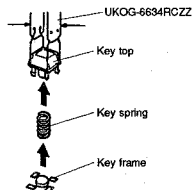- Key frame
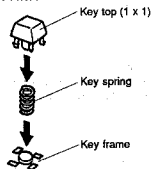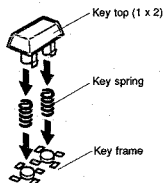
Fig. 3-23

4) SRV programming

JOB #904-A, B : Number of departments.

4. SERVICE PRECAUTION

When removing the top cabinet, lift it up in the first place as illustrated, then remove the transformer cable and remove the top cabinet.
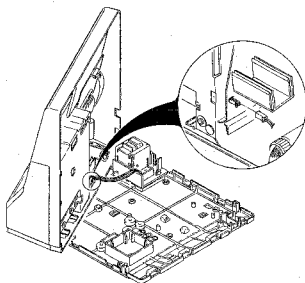

Fig. 4-1